

Math 206 - Quiz 4

February 7, 2012

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (1 point) Three green marbles, four blue marbles, and six red marbles are placed into a jar, and one is selected at random. What is the sample space for this experiment? Is your sample space uniform? Explain.

$$S = \{g, b, r\}$$

THIS IS NOT A UNIFORM

SAMPLE SPACE BECAUSE THE

OUTCOMES ARE NOT EQUALLY

LIKELY: $P(g) = \frac{3}{13}$, $P(b) = \frac{4}{13}$, $P(r) = \frac{6}{13}$

2. (1 point) Refer to the problem above. If B is the event of drawing a red marble, what are \bar{B} and $P(\bar{B})$?

\bar{B} IS THE EVENT OF DRAWING A MARBLE THAT IS NOT RED
 $= \{g, b\}$

$$P(\bar{B}) = 1 - P(r) = \frac{7}{13}$$

3. (1.5 points) Suppose A and B are events such that $P(A) = 0.46$, $P(\bar{B}) = 0.66$, and $P(A \cup B) = 0.72$. Find $P(A \cap B)$.

$$P(A) = 0.46$$

$$0.72 = 0.46 + 0.34 - P(A \cap B)$$

$$P(B) = 0.34$$

\Rightarrow

$$0.72 = 0.80 - P(A \cap B)$$

$$P(A \cup B) = 0.72$$

$$P(A \cap B) = 0.08$$

4. (1.5 points) Give a brief definition of each of the following.

(a) Sample space - SET OF ALL POSSIBLE OUTCOMES
OF AN EXPERIMENT

(b) Event - ANY SUBSET OF THE SAMPLE SPACE

(c) Multistage experiment - A SINGLE EXPERIMENT WITH A
SINGLE SAMPLE SPACE THAT IS BEST CONCEPTUALIZED
AS BEING MADE UP OF SMALLER, INDIVIDUAL
EXPERIMENTS (STAGES)